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To: Dr. Bevan
Dr. McKinney
Dr. Merton
Dr. Scribner

From: Ed Furtek

Topic: CSPHW Pre-Workshop Planning Session, Center for Advanced Study, Stanford University, Stanford, California; April 19, 1973. Participants included: Paul Armer, Andriano Buzzati-Traverso, Victor Fuchs, Joshua Lederberg, John C. McKinney, John Platt, Harry Rowen, Richard Scott, Richard Scribner, Joseph Weizenbaum.

The discussion ranged over six topics: 1) the interface between knowledge and action; 2) the effect of the market and the polity on science institutions; 3) the adequacy and inadequacy of past and present science institutions; 4) the organization of science manpower, the disciplines, and the university; 5) the organization of the project, and 6) the distribution of the project's results.

Interface

The central topic of discussion was the development of organizational arrangements for the translation and delivery of science knowledge. Victor Fuchs noted that the project's goal of applying science knowledge to social needs is understandable in economic terms as the production of a commodity for an existing, unsatisfied market.

Harry Rowen observed that there may be a relationship between the mismatch of disciplinary expertise with social needs and the government's organizational structure that is designed to deal with social needs. He suggested that this problem could be studied by comparing: a) social needs that have been identified, b) government organizations that are supposed to attack those problems, and c) the manner and success with which the disciplines have studied them.

Joshua Lederberg stated that the institutional level of analysis enables one to understand some of the problems related to the application of science. Using this approach he observed that the market system has provided an effective system for the motivation and production of innovation. However, the competitive nature of private industry requires that it exploit all available public technology and protect its own private innovations. This restricts the contribution that it can make to the solution of social problems. In contrast to the protectionist practices of the market system, the academic system provides an overall subsidy for the acquistion and distribution of new knowledge.

DickScott noted that the failure of philanthropic foundations to support non-academic, problem-solving organizations has resulted in a dependence of government agencies to perform those functions. Government labs, however, are narrow and rigid in their approach

to problems because they are restricted by the pressure of interest groups and the latent goals of politicians. Lederberg suggested that our institutional framework needs a new type of public enterprise for the support of knowledge applicable to social problems.

The Market and the Polity

Economic, political and social conditions are crucial factors affecting the visibility and success of any institutional innovation. Lederberg and McKinney commented that widespread economic and political support enabled the agricultural extension program to develop a continuum of institutions ranging from a government organization (the land grant system), to intermediate research institutes (experimental stations), to agents in the field (agricultural extension agents). One result of this program was the development of a strong rural sociology approach to the problems of community development.

Lederberg emphasized that it is difficult to bring a science into any area unless market factors favorable to investment are already in existence. He demonstrated this point with a description of the problems confronting the advancement of birth control technology. He reported that the success of private industry in this field has restricted its interest in basic research into the process of reproduction.

Pregnancy risks that were acceptable in the early days of birth control research are no longer tolerable in the public's eyes. The uncertainty of its pay-offs has resulted in industry cut backs in birth control R & D. Thus, as technological efficiency increases, the influence of moral and economic factors on the feasibility of innovation also increases.

Paul Armer noted that the excellence of Rand was due in large part to the coincidence

of social conditions that provided it with stable economic support and autonomy in its treatment of research problems. Buzzati-Traverso suggested that a different set of favorable conditions, including an awareness of social problems and a large supply of qualified scientists, exists at the present time to allow for the development of a unique kind of science institution.

(In) adequacy of present institutions

Paul Armer suggested that we examine the adequacy of past and present problem-solving mechanisms in order to gain a better understanding of what we can do about developing an interface between knowledge and action. Harry Rowan noted that there are new problem areas, such as the environment, where a broad based commitment to problem solving exists but where the institutional means for dealing with the problems are not yet developed.

Buzzati-Traverso pointed out that in most instances the application of science and technology has not been thought out. He proposed that one task of this project should be the explication of problems that grow out of the current situation. John Platt noted that there are a number of existing, formal and informal agencies that raise public awareness of emerging social problems. In so doing, these groups serve as catalysts that stimulate citizen opinion and, thereby, bring government action to bear on social issues. John McKinney observed that although the market for consciousness-raising efforts continues to expand, few of these groups have attempted to apply knowledge to the solution of these problems.

McKinney noted that the presence of an educated public provides a receptive audience for such consciousness-raising organizations but does not guarantee that the advocates for

such causes will develop systematic and reliable indicators of social needs. Lederberg concurred asserting that a new type of demogogue has emerged in our society. Public spokesman with scientific or technological backgrounds have acquired considerable political clout in our society. In fact, some advocates (e.g. Paul Ehrlich) may bring undue hardships without having to provide scientific validation for their programs and without having to bear responsibility for their results.

Harry Rowan observed that there are some areas where the failure to perceive emergent problems has resulted in haphazard technological developments. He noted that the way in which the industry and technology of cable TV are structured can adversely affect society. In this realm legal decisions regarding the rights and ownership of public communication will have long term social consequences.

McKinney suggested that a part of the failure to develop institutions for the application of science is due to the fact that a number of workable, problem-solving mechanisms have not been generalized from one sector to another. Lederberg commented that such mechanism have not been generalized because some fields have differing levels of competence, organization and support. In addition, the subject matter of some areas is not amenable to the management structures that characterize other mission-oriented programs.

Lederberg stated that the Rice Institute is an example of a problem-solving mechanism that did not require a unique organizational structure to accomplish its goal. Although The Rice Institute did not develop any science innovations it is unique because it has had broad based support for the solution of a recognized problem. Lederberg contrasted this

to the situation in American agricultural research where political and economic support for it have decreased with increasing levels of agricultural production.

The Organization of Scientific Manpower

Joshua Lederberg noted that social scientists need to be given some autonomy in their study of social problems. This autonomy must include their entrance into large scale, long term, experimental approaches to social problems.

To be effective this involvement must be engaged in outside of the university structure. The university must be maintained as the center for basic research. Joshua Lederberg disagreed with the notion that free standing, basic research institutes provide any advantage to our present institutional arrangements. He stated that university students provide the stimulation that enables basic research scientists to question the assumptions and direction of their research. McKinney suggested that junior members and post doctoral students could perform this same catalytic function in basic science research institutes. Buzzati-Traverso noted that the Max Planck Institutes have continued to be productive and have profited from their external relationship to universities.

Dick Scott reaffirmed Dr. McKinney's expressed concern with the dangers of adding on functions to the university. He noted that policy-oriented research always raises questions regarding the implications of the policy commitment for the spirit of free inquiry. He asserted that the university should serve as: 1) the center for inquiry and, 2) the source of critical examination of the assumptions and beliefs guiding that inquiry. It is not the place for decision-making or the implementation of programs. Scott observed that the research

that results from coalitions between academic departments and extra-university agencies is usually biased.

John Platt disagreed with the generality and conservatism of this perspective. He suggested that some problem areas must be lived through, for example, the evaluation of legal aid programs, and, therefore, are not approachable from the detached, academic point of view. He contended that the university should be given more freedom to get involved in the solution of controversial problems because scientists are better prepared than the citizenry at large to understand the implications of problems in a technological age. He pointed to the political activity of Linus Pauling as an example of how scientists might better use their expertise to serve society.

Lederberg rejected this view of the university. He stated that insofar as the university takes on the role of advocate for social and political causes it limits its contribution to scholarship and endangers the support of that activity by government funding agencies. McKinney added that the involvement of the university in extra-scholarly activities is restricted by the liabilities that such mission-oriented work entails.

Scott suggested that there is a need for organizations that would serve as "half way houses" between the university and the realm of social problems. In this arrangement faculty would have the mobility to leave the university to do problem-solving work and could return to it without being penalized for their involvement in policy-oriented research. He mentioned the Sloan Foundation as a model for this arrangement. It allows executives to leave the industrial sphere and go to the university to re-establish contact with the goals and ideas of academic research.

Scott also argued that R & D divisions in industry and government provide models for problem-solving institutions. He suggested that good science knowledge isn't developed or produced efficiently without contact with a problem sector. Many areas in the social sciences are underdeveloped because of a lack of connection with problem-solving and policy making. He concluded that we don't need new institutions but that we do need to move R & D institution into new sectors with long term support for experiments.

As an example Scott suggested that social scientists be brought into a closer relationship with practitioners in school programs. To guarantee their motivation and productivity social scientists need to be given an expanded role and secure, long-term, funding. In addition, their projects need to be based on a systematic, rather than a piece-meal, approach to experimental intervention.

Dr. J. Weizenbaum commented that the Educational Research C enter at MIT attempted a similar mix of scientists and practitioners. He reported that the project didn't work because there was no incentive for university people without tenure to work on the project. University departments refused to include work on mission-oriented projects as part of a candidate's qualifications for tenure. He added that in a field as experimental as education any organization which restricted recruitment to only tenured perople would guarantee the death of that organization's creativity.

Scott countered this argument, stating that the over supply of university teaching candidates and their new interest in social amelioration alters this situation and makes it possible to develop research institutes dedicated to problem-solving research.

## Organization of the Project

Lederberg suggested that since this project is interested in institutional innovation it should contribute to that goal by initiating new methods in its own organization. He proposed that cooperative rather than individual research efforts be encouraged for the development of the project papers. Buzzati-Traverso proposed that the project try to find support for a 3 to 6 month long seminar including divergent views from various disciplines and perspectives to get a greater range and depth of expertise.

## Distribution of Project Results

An important element in the organization of any project is the distribution of its results. Lederberg commented that the effectiveness of the project would be enhanced by developing new means for communicating the product of its deliberations.

Lederberg criticized the National Academy of Science approach to the dissemination of its conference results. The NAS format requires the formulation of a consensual document which is given the quasi-official status of the Academy. The names, reputation, and media coverage that surround NAS reports give them an inertia and power that tends to close, rather than open discussion. He encouraged us to protect the divergence of contributing participants in order to maintain the spirit of the dialogue.

Lederberg rejected the use of Science magazine as a forum for the publication of project reports. In this way the output of the project won't look so much like an official statement for AAAS. If funds are available the development of a new journal would contribute to the expansion of discussion on our topic. Buzzati-Traverso stated that UNESCO's

publication, The Impact of Science and Technology, has a growing interest in these issues. He suggested that we contact Arthur Solomon (AAAS) about the possibility of combining our efforts with those of UNESCO's international science organization.

Platt suggested that H. R. Hopper of the Canadian International Development Research Center might be interested in sponsoring research into the problem of institutional innovation. Lederberg proposed that we attempt to publish workshop results in journals before it appears in either the media or book form. This keeps discussion open by taking the "sting" out of its claim to definitiveness.

Scott and Lederberg agreed that it is important to develop a dialogue regarding the results of the project with decision makers,as well as with academic researchers. Both groups are necessary if the research results are to be refined and put into action. McKinney noted that the university plays a central role because it provides rigorous analysis in addition to maintaining ties that penetrate the rest of society.